California Department of Transportation

Presents

Mobile Work Zone Protection Device (Balsi Beam)

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Mobile Work Zone Protection Device (Balsi Beam)

Invented / Designed By:

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Using Concepts Researched By:

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Based On An Incident Involving:

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Division of Maintenance

Mobile Work Zone Protection Device (Balsi Beam)

Acknowledgement

The California Department of Transportation (Caltrans) acknowledges the Federal Highway Administration (FHWA) for its encouragement, help and support in presenting this safety equipment.

Highway 280 - January 19, 2001

Why the Balsi Beam?

Balsi Beam

- As a result of a serious accident, Caltrans' Division of Maintenance began looking into ways to protect its employees on foot.
- Caltrans' Division of Research and Innovation researched concepts for a protection system.
- Caltrans' Division of Equipment designed and built a Mobile Work Zone Protection Device (Balsi Beam).
- The Balsi Beam has its own dedicated tractor truck to transport it to the worksite at normal highway speeds without the need for any permits.

How it Works

- Once on site, the Balsi Beam can be easily set up from the cab of the tractor truck.
- One of the beams is rotated to provide a double beam barrier.
- The beams telescope to provide 30 feet of protected workspace.
- The Balsi Beam can be used both in median and shoulder areas by rotating either of the beams to the other side.

Balsi Beam

Arriving On Site

Patent Pending

Balsi Beam

Setting Up At The Site

Patent Pending

Balsi Beam

Rotating One Of The Beams

Patent Pending

Balsi Beam

Telescoping The Beams

Patent Pending

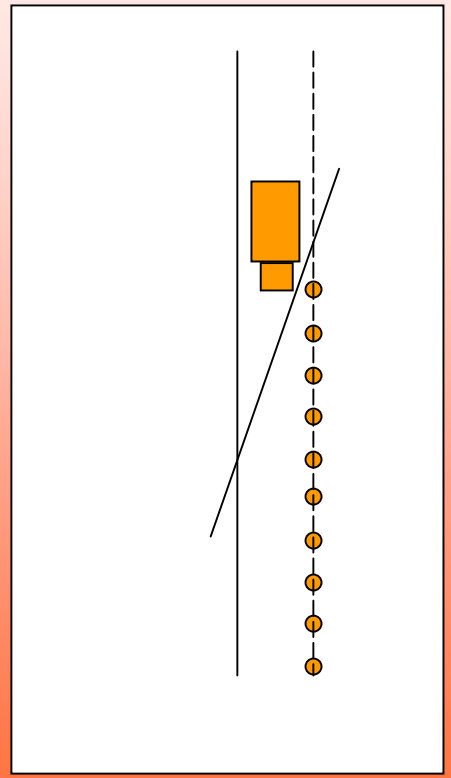
Balsi Beam

Working In The Protected Area

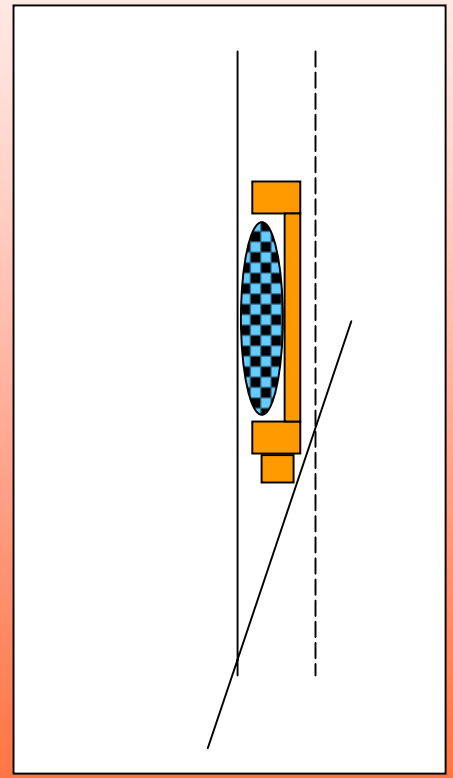
Patent Pending

Balsi Beam

Physically Protected Area



Without Balsi Beam

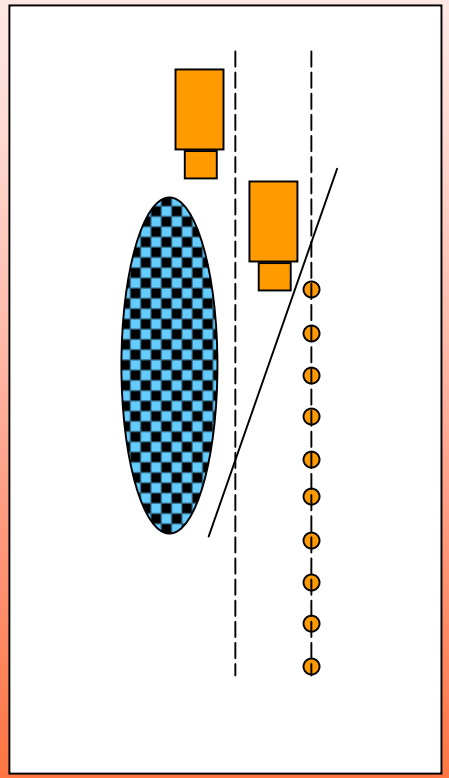


With Balsi Beam

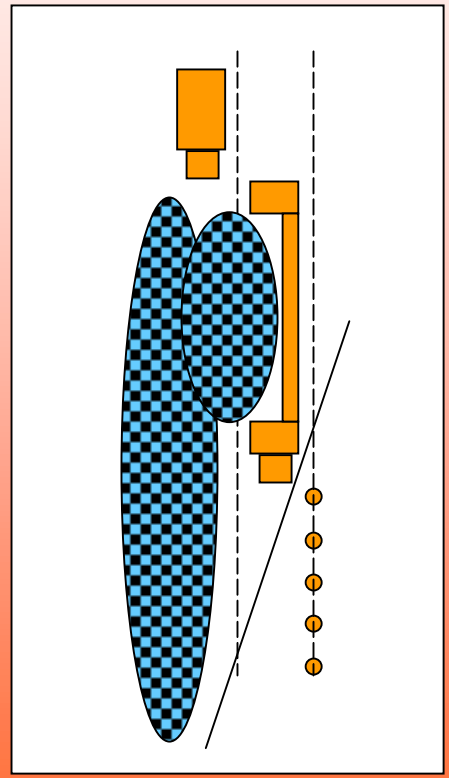
Single Lane Closure

Balsi Beam

Physically Protected Area



Without Balsi Beam



With Balsi Beam

Two Lanes Closure

Balsi Beam

- Caltrans' Division of Equipment designed the Balsi Beam in 2002.
- A working prototype was built in 2003.
- The working prototype was crash tested in 2003 using a small car and a full size pickup truck.
- The result of crash test were very good, for both the Balsi Beam and the impacting vehicles.
- Caltrans currently has a patent pending for this barrier.

Balsi Beam

Double click the paperclip to see a demonstration of the Balsi Beam in action

Crash Test Using Full Size Pickup Truck

Balsi Beam

History

Following is a quick history on the development of this ”Mobile Work Zone Protection Device”.

The Caltrans Division of Equipment developed a truck mounted, expandable beam that will provide work zone protection comparable to a concrete barrier.

The system consists of a tractor-trailer combination, where the trailer extends and transforms into a 30-foot long work zone protector.

1. Articulate need.

Over the years many Caltrans employees have been seriously injured or lost their lives while working on or near the California State highways.

"Protecting our workers and the traveling public are our highest priorities" says Randell Iwasaki, Deputy Director for Maintenance and Operations.

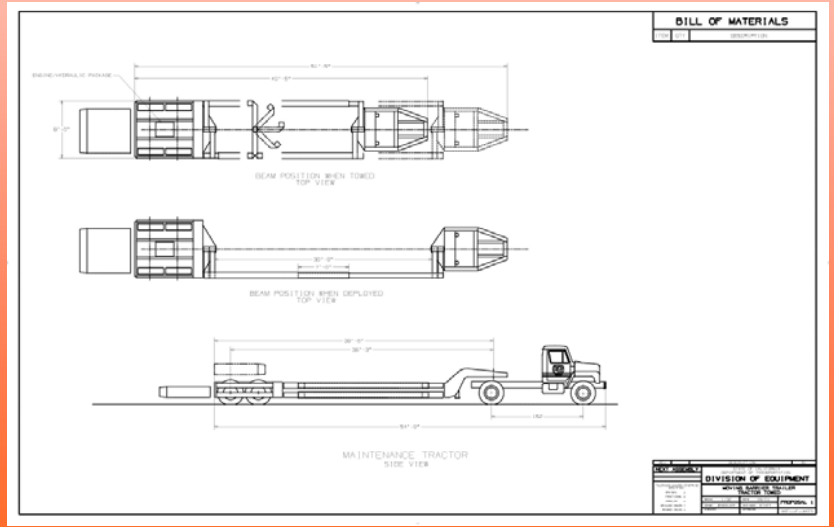
2. Develop working parameters.

The Division of Maintenance provided the following parameters:

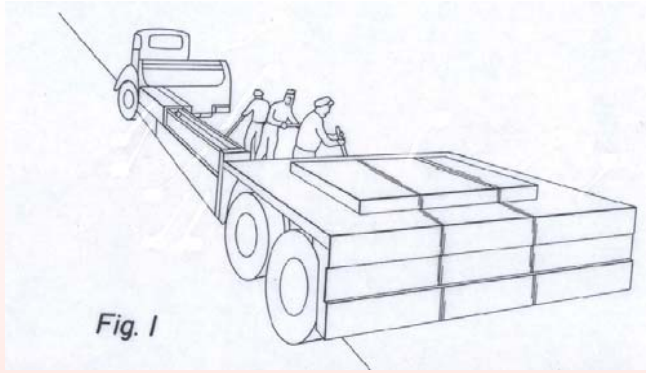
1. Provide protection for personnel working on roadside.
2. Thirty foot work zone.
3. Deploy from vehicle cab.
4. No special permits — conform to California Vehicle Code, including 65’ maximum overall length, 102” maximum width, and 40’ kingpin to rear axle.

3. Develop design concepts.

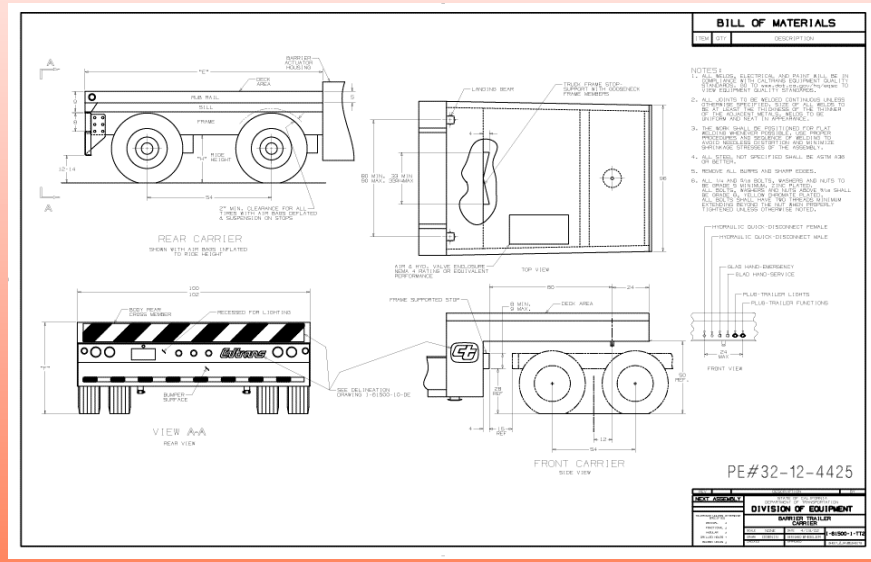
The Engineering Design group in the Division of Equipment worked on numerous design concepts.



4. **Discuss design concepts and agree upon a proposal.**



5. **Develop drawings and specifications.**



6. **Expedite purchasing process.**

Prepare documents, identify vendors, award contract.

DRAWINGS, BILLS OF MATERIALS, EQUIPMENT BUDGET REQUESTS, PURCHASE ESTIMATES, INVITATIONS FOR BID

7. Fabricate vehicle.

Working closely with a local California trailer manufacturer, who helped design the goose neck and rear carrier, a well built and reliable product was produced.

Each side of the trailer consists of high-strength steel box section beams that are capable of extending to provide a 30-ft secure work zone.

Using hydraulic power, each beam can rotate to either side (left or right), depending on which side of the road a protective barrier is needed.

The trailer was built and delivered within a 4-month period.

8. Crash test.

The system "performed exceptionally well in testing," says Cal Schiefferly, Senior Equipment Engineer in the Caltrans Division of Equipment. "We were very satisfied with the results."

Double click the paperclip to see a demonstration of the Balsi Beam in action

9. Deploy.

Double click the paperclip to see a sild show of the Balsi Beam.

The Mobile Work Zone Protection Device is now deployed in the field by the Caltrans Maintenance Division to gain experience in its operation and evaluate its performance.

For additional information on the Balsi Beam contact Kris Teague at Kris_Teague@dot.ca.gov or (916) 227-9608.